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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SAOUD, CHRISTINE J	

ART UNIT	PAPER NUMBER
1647	

DATE MAILED: 06/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/932,888	SPURLOCK ET AL.	
	Examiner	Art Unit	
	Christine J. Saoud	1647	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1-5 and 13-40* is/are pending in the application.

4a) Of the above claim(s) *31-40* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-5 and 13-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 6-12 have been canceled and claims 13-40 have been added in the amendment filed 23 February 2004. Claims 31-40 are withdrawn as being directed to non-elected inventions. Newly submitted claims 31-40 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the claims are directed to methods of detecting DNA (method of using the claimed invention), methods of isolating DNA (method of using the claimed invention), and methods of determining the susceptibility of a pig to fat deposition (not necessarily related to the claimed invention). These inventions are distinct from the claimed and elected subject matter because they would be considered methods of use of the claimed invention and are separately classifiable.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 31-40 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03. Claims 1-5 and 13-30 are under examination in the instant application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Any objection or rejection of record which is not expressly repeated in this action has been overcome by Applicant's response and withdrawn.

Applicant's arguments filed 23 February 2004 have been fully considered but they are not deemed to be persuasive.

Claim Objections

Claims 17-18 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The instant claims depend from base claims which have two requirements: 1) the DNA molecule must encode a porcine adipocyte leptin and 2) must hybridize to a specified sequence. The dependent claims 17-18 place size limitations on the DNA of "at least 20" or "at least 50" bases, which is no where near the necessary size of a DNA which will encode a porcine leptin polypeptide, absent evidence to the contrary. Therefore, the claims do not appear to further limit the claims from which they depend.

Double Patenting

Applicant's Terminal Disclaimer has been received, is proper and has been entered into the file.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 13-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 13-30 are directed to nucleic acid molecules (DNA, mRNA) which "hybridizes" to a particular disclosed nucleic acid sequence, wherein no hybridization conditions are provided. Some of the claims recite that a certain number of bases will hybridize (at least 20, at least 50), or that "substantially all" of the bases will hybridize, or "under hybridizing conditions". However, these claims are indefinite for the failure to indicate what hybridization conditions are to be used or what degree of identity is intended with "substantially all". Without knowing what conditions are to be used, the skilled artisan would not know if a molecule which may be isolated by using the disclosed nucleic acid molecule will be encompassed by the claims because the metes and bounds of what is claimed is not clear. Therefore, the claims are indefinite.

Claims 14-15, 17-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The instant claims are directed to nucleic acid molecules which encode a porcine leptin polypeptide, wherein the nucleic acid hybridizes to at least 20-50 bases of SEQ ID NO:1, 20-50 bases of SEQ ID NO:3, or wherein the nucleic acid molecule is at least 20-50 bases long. First, the art does not recognize a nucleic acid as short as 20-50 nucleotides long that encodes a leptin molecule and the instant specification fails to teach a molecule meeting this limitation. Therefore, one of ordinary skill in the art would not find such a length sufficient for encoding a leptin molecule from pigs, absent

evidence to the contrary, and the claims are not enabled for such. Next, SEQ ID NO:1 is a genomic sequence with significantly long stretches of non-coding regions. Claims 14-15 indicate that the isolated DNA will hybridize to at least 20 or 50 nucleotides of SEQ ID NO:1, however, the vast majority of the nucleic acid molecules which hybridize (no conditions are provided, so the majority of nucleic acids in existence would hybridize under various conditions) to 20 or 50 bases would not meet the functional requirements of the claims, which are to encode a porcine leptin polypeptide. To suggest that one could then test each molecule for functional activity is not an enabling disclosure since the majority of nucleic acids from the pig would hybridize (DNA is inherently sticky) but would not be expected to encode a leptin molecule. Therefore, the claims are not enabled.

Claims 1-5 are rejected and newly added claims 13-30 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement for the reasons of record in the Office action mailed 22 September 2003. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant argues at page 13 that "the written description of the invention contained in the parent application no. 08/692,922 is adequate to support the recited "allelic variant" terminology" as defined in the claims. Applicant asserts that the Examiner erred by construing allelic variant as being a "single"specific molecule. For clarification, as supported by the references provided by Applicant, an allelic variant of a

given gene is a naturally occurring molecule which differs in sequence (by insertion, deletion, substitution) In other words, the point the Examiner was attempting to make was that an allelic variant is a product which occurs in nature and is not just any variant sequence of gene. There can sometimes be hundreds of allelic variants for a given gene and sometimes there are none.

Applicant asserts at page 14 of the response that the parent application "fully characterizes allelic variants using words, structures, and examples (emphasis omitted)". However, a review of the instant application and the parent application reveals only a single genomic DNA molecule, with no variant molecules (allelic or other).

Applicant asserts at page 15 of the response that the parent application describes an allelic variant as a DNA molecule that is substantially similar to the porcine leptin DNA sequence identified as SEQ ID NO:1. However, an adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it. Specific molecular structure is required (Fiers v. Revel, 25 USPQ2d 1601, 1606 (CAFC 1993) and Amgen Inc. v. Chugai Pharmaceutical Co. Ltd., 18 USPQ2d 1016). The statement that the allelic variant differs from the disclosed DNA sequence and that it is "substantially similar" to the disclosed sequence is not a description sufficient for the skilled artisan to know if they are in possession of an allelic variant, a naturally occurring molecule. For example, if an artisan was handed an nucleic acid and it had a sequence with 3 differences, at positions 666, 1620, and 3245, would that artisan know if the molecule in hand is an

allelic variant based solely on Applicant's disclosure? No. The Examiner does not even know if such a molecule is an allelic variant. It is a variant that was "created" by the Examiner, but since the disclosure does no provide a precise definition, such as by structure, formula or chemical name, of the claimed subject matter (allelic variant) sufficient to distinguish it from other materials (i.e. variant molecules), the artisan would not know if they were in possession of an allelic variant or not.

At page 16 of the response, Applicant points to a definition of "allelic variant", and asserts that it is consistent with the terminology used in the disclosure. The Examiner does not disagree with the definition cited by Applicant, but again, must emphasize that "allelic variant" refers to a naturally occurring molecule(s) with a precise nucleic acid sequence. This differs from any other variant which could be made or envisioned, such as nucleic acid variants which have been modified for expression in bacteria. These nucleic acid molecules would be variant molecules, but in no way could they be construed as "allelic variant" within the art recognized meaning of the term, absent evidence to the contrary.

Applicant at page 16 of the response asserts that the parent application "specifies allelic variants of the porcine leptin DNA in terms of variations of the DNA sequence identified as SEQ ID NO:1 or SEQ ID NO:3, where the variations may include any combination of deletions, insertions or substitutions of the DNA sequence identified as SEQ ID NO:1 or SEQ ID NO:3, with the caveat that the variations are substantially similar to the DNA sequence identified as SEQ ID NO:1 or SEQ ID NO:3". However, Applicant is essentially claiming a genus with a single disclosed species as support for

the claimed genus "allelic variants". In claims to genetic material, however, a generic statement such as vertebrate cDNA or mammalian cDNA , or in the instant case allelic variant, without more, is not an adequate written description of the genus because it does not distinguish the claimed genus from others, except by function. It does not specifically define any of the genes that fall within its definition. It does not define any structural features commonly possessed by members of the genus that distinguish them from others. One skilled in the art therefore cannot, as one can do with a fully described genus, visualize or recognize the identity of the members of the genus. A definition by function does not suffice to define the genus because it is only an indication of what the gene does, rather than what it is. See Fiers, 984 F.2d at 1169-1171, 25 USPQ2d at 1605-1606. Accordingly, "naming a type of material generally known to exist, in the absence of knowledge as to what that material consists of, is not a description of that material" (University of California v. Eli Lilly and Co., (CAFC) 43 USPQ2d 1398 at 1406).

Applicant argues at page 17 of the response that allelic variants could be identified using RFLP or hybridization techniques. However, a method of making or identifying a molecule is not the same thing as a written description of the molecule which is being claimed. Applicant is reminded that Vas-Cath makes clear that the written description provision of 35 USC 112 is severable from its enablement provision (See page 1115). As in Fiddes v. Baird, claims directed to mammalian FGF's were found unpatentable due to lack of written description for the broad class because the specification provided only the bovine sequence. In the instant situation, the

specification only provides a single nucleic acid molecule, but fails to provide a description of the "broad class" of allelic variants, regardless of whether they could be made or isolated.

Applicant asserts at page 17 of the response that "the test for meeting the written description requirement is whether a person skilled in the art is reasonably able to recognize the inventor possessed what is being claimed at the time of filing". The Examiner agrees that this is the test, and that a person skilled in the art would not come to the conclusion that Applicant was in possession of allelic variants of porcine leptin. Applicant has cited a reference wherein an four polymorphisms in the porcine leptin gene were characterized and evaluated. No where in the instant specification or in the parent specification is there any disclosure of the molecules identified by Kennes et al.; i.e. there is no adequate written description of those molecules such that the skilled artisan would be able to distinguish that material from any other material encoding leptin. The specifics which make the molecules allelic variants of leptin (the positions which were discovered to vary) cannot be predicted from the single nucleic acid molecule taught by Applicant, nor can the skilled artisan envision the structure of an allelic variant since there is no disclosure of how the variant will differ from the disclosed molecule of Applicant. Applicant asserts that the structure of other allelic variants within the scope of the disclosure of the parent application "may be predicted on the basis of the nucleotide sequence of SEQ ID NO:1". This statement is not supported by any facts of record or on any line of scientific reasoning in the record. One may say that allelic variants are likely to exist because many genes have allelic variants, and can have

hundreds of allelic variants. However, the precise structure of those variants cannot be predicted based on the disclosure of a single molecular embodiment, absent evidence to the contrary. The CAFC in University of California v. Eli Lilly and Co. states that "[a] written description of an invention involving a chemical genus, like a description of a chemical species, "requires a precise definition, such as by structure, formula, [or] chemical name," of the claimed subject matter sufficient to distinguish it from other materials. *Fiers*, 984 F.2d at 1171, 25 USPQ2d at 1606; *In re Smythe*, 480 F.2d 1376, 1383, 178 USPQ 279 284-285 (CCPA 1973)".

Applicant additionally argues at page 18 of the response that allelic variants could be identified using methods of isolating nucleic acids, however, this is not a written description of the claimed invention, but rather, a method of obtaining the claimed invention. Applicant cites Kennes et al. as support that one of skill in the art could identify allelic variants of SEQ ID NO :1 or SEQ ID NO :3 that fall within the scope of the claimed invention. However, as stated previously, it is assumed that allelic variants for SEQ ID NO:1 and 3 will exist and that one of skill in the art would be able to "identify" them by using a nucleic acid to hybridize to other porcine sequences and isolate them. However, the nature or character, or sequence of those variants is not described such that a person in the art would recognize that Applicant was in possession of them at the time of filing the instant invention. Kennes et al. found 4 polymorphisms at positions 2845, 3996, 2728 and 3469. These positions are not identified in the specification as being important, likely to contain differences, etc. The nature, or description, of the allelic variation that occurs in the porcine leptin gene is not

taught or described in the instant specification. The allelic variation was not described until Kennes et al. isolated the nucleic acid molecules and characterized them and provided a written desciption of the material, which in the case of the nucleic acid is the sequence of the molecule. The instant specification neither "predicted" nor "identified" the allelic variants of Kennes in any way that would convince a person in the art that they were in possession of the claimed invention, absent evidence to the contrary. A method of identifying or a method of isolating a molecule is not the same thing as an adequate written description of the molecule. This position is supported by the CAFC decision in University of California v. Eli Lilly and Co.. The fact pattern in this case is most closely related to the U. Calif. v. Eli Lilly case in that what was being claimed there is a genus of nucleic acids with a single species disclosed.

Applicant argues at page 20 of the response that "the structure of various allelic variants of porcine leptin DNA were determined and predicted by others" using the disclosure of the parent application. This assessment of Kennes et al. is erroneous. Kennes did not "predict" the structure of the allelic variant, but rather, using methods to isolate allelic variants which were assumed to be present. As stated previously, a method of making (isolating) a compound, is not the same as a written description of that compound. The claims were not rejected for a lack of an enabling disclosure; in fact, the specification was fully enabled for isolating allelic variants. But the specification lacked an adequate written description of allelic variant for the reasons of record.

Applicant asserts that reliance on Fiers is "incorrect because Fiers is concerned with determining priority based on conception of an invention". This argument is not persuasive because even the CAFC uses the holding in Fiers with regard to written description matters (see U. California). Applicant has failed to demonstrate possession of allelic variants consistent with the holding in the cited case law of Fiers and U. California, absent evidence to the contrary.

Applicant's continued reliance on the disclosure of Kennes et al. is noted, but not persuasive. Kennes et al. demonstrate that the specification was enabling for the isolation of allelic variants, but in no way demonstrates that Applicant was in possession of an adequate written description of this subject matter for the reasons of record. The rejection is maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 22, 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friedman et al. (U.S. Pat. No. 6,309,853).

The instant claims are directed to isolated nucleic acids which encode porcine leptin and hybridize to SEQ ID NO:3 or a "functional derivative thereof" (see claims 22, 27) or "variant" (see claims 24-26). The prior art of Friedman et al. (U.S. Pat. No.

6,309,853) disclose nucleic acids which encode human and mouse leptin, which would be considered functional derivatives and/or variants of SEQ ID NO:3 since they encode leptin molecules and would possess similar functional properties as those of the porcine leptin, absent evidence to the contrary. Friedman et al. teach that the leptin gene (or OB) could be isolated from domestic animals using the methods disclosed therein (see column 26, line 53 to column 27, line 49). Friedman et al. specifically mention swine as a domestic animal for which leptin would be useful (see column 48, lines 41-57). Friedman et al. do not specifically disclose an isolated nucleic acid encoding a porcine leptin polypeptide. However, it would have been obvious to use the nucleic acid of Friedman et al. encoding human or mouse leptin and hybridize it to a porcine cDNA library and isolate a nucleic acid molecule encoding porcine leptin because Friedman et al. teach methods for isolating leptin encoding nucleic acids and also teach that it would be beneficial to administer leptin to swine. Therefore, the invention as a whole would have been obvious at the time it was made, absent evidence to the contrary.

Applicant should note that the instant rejection is being made because the claims do not require the specifics of SEQ ID NO:1 or 3, and therefore, methods of isolating nucleic acids for leptin using a functional equivalent of porcine leptin encoding DNA encompasses methods using human or murine DNA encoding leptin.

Conclusion

No claim is allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine J. Saoud whose telephone number is 571-272-0891. The examiner can normally be reached on mttr, 8:00-2:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Kunz can be reached on 571-272-0887. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CHRISTINE J. SAOUD
PRIMARY EXAMINER

Christine J. Saoud